

By this amendment, Claims 21 and 23 have been canceled without prejudice or disclaimer. Independent Claim 20 has been amended to include the features recited in canceled Claims 21 and 23, as will be explained further below, and Claim 22 has been amended to depend from Claim 20. In addition, new Claims 24 and 25 have been submitted to further define the features of independent Claim 20. Favorable consideration of pending Claims 20, 22, 24 and 25 is respectfully requested.

Claim 20 was rejected under 35 U.S.C. §102(e) as being anticipated by Barrow, and Claims 21-23 were rejected under 35 U.S.C. §103(a) as being anticipated by Barrow. Applicant respectfully traverses both of these rejections, and further requests that the rejections be reconsidered and withdrawn, for the reasons that follow.

First of all, since Claim 20 has been amended to recite the features of canceled Claims 21 and 23, it is respectfully submitted that the rejection of Claim 20 under 35 U.S.C. §102(e) over Barrow is rendered moot, and therefore this rejection should be withdrawn.

Furthermore, in view of the present amendments to the claims, the traversal of the rejection of Claims 21-23 under

35 U.S.C. §103(a) over Barrow is made with regards to amended Claims 20 and 22, as well as new Claims 24 and 25.

The claimed invention, as recited in amended independent Claim 20, relates to a novel semiconductor device having a first bump unit, comprising a plurality of heat-radiating bumps that are disposed a first distance apart from each other, disposed in a central area of a back surface of the semiconductor device, and that radiate heat from a central portion of the semiconductor device. The semiconductor device also includes a second bump unit, comprising a plurality of connection bumps that are disposed a second distance apart from each other, disposed in a peripheral area of the back surface of the semiconductor device, for transmitting signals therefrom. The peripheral area surrounds the central portion of the back surface of the semiconductor device. Claim 20 further recites that the second distance that separates the bumps of the second bump unit is greater than the first distance that separates the bumps of the first bump unit, and further, the second distance is less than a third distance that separates the central area and the peripheral area of the back surface of the substrate.

On the other hand, it is acknowledged in the Office Action that Barrow does not teach or suggest the

relationships between the width of the intermediate area (Claim 22) and the relationships of the distances that separate the bumps of the first and second bump units respectively (Claim 20, as amended).

Applicant disagrees with the assertion that the claimed relationships between such distances are merely "optimum or workable ranges" that involve "only routine skill in the art" that would render the claims obvious to one of ordinary skill. Rather, such features clearly patentably distinguish the pending claims from the teachings of Barrow, and any suggestions provided thereby. Specifically, Barrow only describes solder balls 34, with no distinction whatsoever of particular ones of the solder balls 34 being used for radiating heat from the solder pad 28 or for transmitting purposes, as in the claimed invention. Further, Barrow describes the solder balls 34 as being attached to the solder pad 28 (Fig. 3) by known ball grid array processes, with no reference being made to any specific distancing of the solder balls based upon their placement along the solder pads, contrary to the claimed invention.

Thus, Barrow fails to distinguish types of solder balls, as in Claim 21, and therefore it logically follows that Barrow fails to even contemplate the physical distance relationship of any particular types of solder balls in

reference to their placement along the solder pad. Consequently, it is respectfully submitted that independent Claim 20, as well as its pending dependent Claims 22, 24 and 25 are clearly not obvious in view of the teachings of Barrow, and accordingly the rejection under 35 U.S.C. §103(a) over Barrow should be withdrawn.

The remaining references of record have been studied. It is respectfully submitted that they do not compensate for the deficiencies utilized in rejecting Claims 20-23.

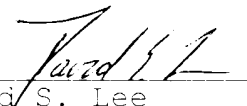
All objections and rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance, and a Notice to that effect is earnestly solicited.

A petition for extension of time is filed herewith. A check in payment of the fee for the extension is also enclosed. If the check is missing or made out for an insufficient amount, please charge deposit account

No. 18-0002, and send a notification accordingly.

Respectfully submitted,

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